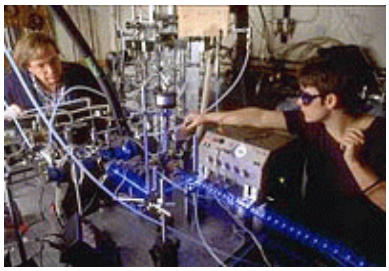
Aeronomy Laboratory

Understanding our complex atmosphere

A NOAA researcher makes observations of chlorine-containing gases during field experiments in Antarctica.



Aeronomy Lab scientists conduct laboratory experiments to study the reactions and properties of atmospheric gases/particles that are important in air quality, ozone depletion and climate.

Studying the fundamentals of air quality with the NOAA Aircraft Operations Center WP-3D aircraft.

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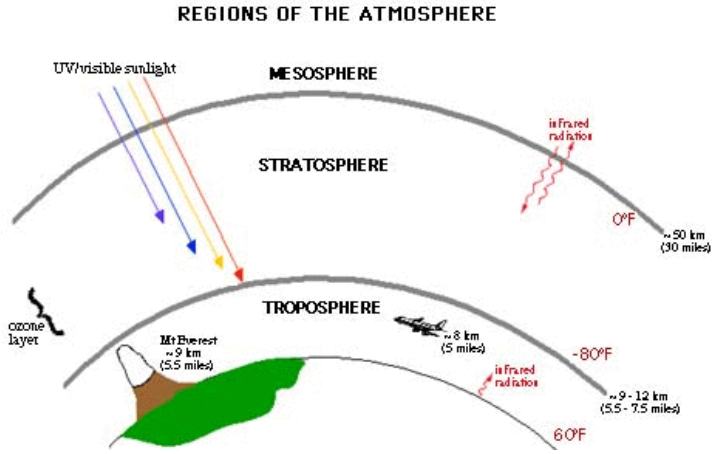
What does the Aeronomy Laboratory do for the nation?

TheThe AeThe Aeronomy LThe Aeronomy Lab's research findings provide a sou decisionsdecisions madedecisions made in industry anddecisions made in industry and quality improvement, and climate change understanding.

ThisThis lab conThis lab conducts scThis lab conducts scientific research aimed at u chemicalchemical and physical prochemical and physical processes chemical and concentratesconcentrates on the lower two atmospheric layersconcentrates on the lowe stratospherestratosphere.stratosphere. Both tstratosphere. Both the troposphere and andand indirand indirect efand indirect effects on the well-being of humankind. In becomebecome increasingly clear that humans are influencing thebecome increasingly ofof the troposphere and the stratosphereof the troposphere and the stratosphere in way Earth s surface.

AeronomyAeronomy LabAeronomy Lab scientists use field, modeling, and laboratory ap Earth sEarth s atmosphere and climate. The Aeronomy Laboratory plays leEarth s atm ininin produciin producing "state-of-the-science" assessment reports for use by national international decision makers.



Recent Accomplishments:

" DevelopedDeveloped and applied a new method to provide realDeveloped and a chemicachemicalchemical composition of individual atmospheric particles. ***Pay findingsfindings alter ourfindings alter our picturefindings alter our pic properties,properties, with improperties, with implicatioproperties, with im particles on climate and the ozone layer.***

" DiscoveredDiscovered new factors that determine Discovered new factors that ***researchresearch is helping toresearch is helping to delineate the relative influe naturalnatural vegetation, agriculture, transportation, and power-generating plantsplants onplants on air quality, and willplants on air quality, and will be inp sound strategies for air quality improvement.***

" FilledFilled key gaps inFilled key gaps in the understandingFilled key gaps in the unde ***Payoffs:Payoffs: The whole picture of polar ozone Payoffs: The whole focus,focus, as described infocus, as described in a summary paper published Laboratory in Science (9 July 1999).***

" PlayedPlayed extensive roles in leading, authoring, and reviewing two international scientific state-of-understandingunderstanding assessments.understanding assessments. ***Payoffs: The documents provide key international decisions regarding the ozone layer and the rapidly growing aviation industry.***

What s Next for the Aeronomy Laboratory?

Science Challenges in the next 5-10 years:

" Ozone Layer
  " What is the impact of the growing number of very short-lived chlorine-containing substances?
  " How best can we detect and interpret the recovery of the ozone layer?
  " How will climate change affect the ultimate recovery state of the ozone layer?
  " How do changes in the ozone layer affect climate, and vice versa?

" Regional Tropospheric Chemistry
  " What will be the impact of growing Asian emissions on the air quality of the Western U.S.?
  " What processes are relevant to the forecasting of regional air quality?
  " What controls the ozone background , and how will proposed stricter regulations affect it?
  " WhatWhat causes fine particles in the atmosphere to develop properties that tWhat causes fine particl degradation?

" Climate Change: Trace Species, Radiation, and Clouds
  " HowHow well can we characterize the role of the various atmospheric trace gases in tHow well can we budget?
  " HowHow well do we understand the role of aerHow well do we understand the role of aerosol How well d of clouds, and the alteration of atmospheric chemical composition?
  " How well do we understand the distribution and changes of atmospheric water vapor?

Research Partnerships:

ThTheThe Aeronomy Lab works with the University of Colorado s Cooperative Institute for ResThe Aeronor EnvironmentalEnvironmental Sciences (CIRES) which was established in 1967 to provide a setting for collaEnvi researchresearch and teaching in the wide-ranging disciplines of theresearch and teaching in the wide-ranging disc joint/cooperativejoint/cooperative injoint/cooperative institutejoint/cooperative institute joint/cooperative institute anjoin of Colorado, NOAA, and other institutions.

Budget and Staff:

TheThe Aeronomy LabThe Aeronomy Lab is aThe Aeronomy Lab is a $12.2 million laboratory ($5.8 million of NOAA with a staff of 117, including 45 federal and 62 university employees.

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AERONOMY LABORATORY